

In the Claims

Claim 1 (currently amended): A method of forming a monolayer of functionalized silicon on a substrate surface, the functionalized silicon including an organic group covalently attached with the silicon, the method comprising exposing the substrate surface to a precursor comprising the functionalized silicon under a pressure of at least 30 psi, the precursor interacting with the substrate to form the monolayer across at least a portion of the surface of the substrate; and wherein the exposing of the substrate surface to the precursor occurs in a supercritical fluid.

Claim 2 (canceled).

Claim 3 (original): The method of claim 1 wherein the pressure is at least 100 psi.

Claim 4 (original): The method of claim 1 wherein the pressure is at least 1000 psi.

Claim 5 (original): The method of claim 1 wherein the pressure is at least 4000 psi.

Claim 6 (original): The method of claim 1 wherein the pressure is at least 8000 psi.

Claim 7 (original): The method of claim 1 wherein the substrate comprises glass.

Claim 8 (currently amended): ~~The method of claim 1 wherein the substrate comprises a glass fiber; and further comprising,~~ A method of forming a fiberglass matrix, comprising:

providing a glass fiber having a surface;

providing a precursor containing functionalized silicon, the functionalized silicon including an organic group covalently attached with the silicon;

exposing the glass fiber surface to the precursor under a pressure of at least 30 psi, the precursor interacting with the surface to form a monolayer containing the functionalized silicon across at least a portion of the surface; and

after forming the monolayer, incorporating the glass fiber into a fiberglass matrix by bonding the organic group within a polymeric material.

Claim 9 (withdrawn): The method of claim 1 wherein the substrate comprises aluminum, and the substrate surface comprises oxygen of aluminum oxide.

Claim 10 (withdrawn): The method of claim 1 wherein the substrate comprises a silicon wafer, and the surface comprises oxygen of silicon dioxide.

Claim 11 (withdrawn): The method of claim 1 wherein the substrate surface predominately comprises carbon.

Claim 12 (withdrawn): The method of claim 1 wherein the substrate surface comprises silicon carbide.

Claim 13 (withdrawn): The method of claim 1 wherein the substrate comprises titanium, and the substrate surface comprises oxygen of titanium oxide.

Claim 14 (original): The method of claim 1 further comprising forming a film of water across a surface of the substrate prior to the exposing of the substrate to the precursor.

Claim 15 (original): The method of claim 1 wherein the precursor is selected from the group consisting of siloxanes, silazanes and chlorosilanes.

Claim 16 (currently amended): The method of claim 1 wherein the exposing of the substrate surface to the precursor ~~molecules~~ occurs for a time of at least about 10 seconds.

Claim 17 (currently amended): The method of claim 1 wherein the exposing of the substrate surface to the precursor ~~molecules~~ occurs for a time of at least about 30 seconds.

Claim 18 (currently amended): The method of claim 1 wherein the exposing of the substrate surface to the precursor ~~molecules~~ occurs for a time of at least about minute.

Claims 19-29 (canceled).

Claim 30 (currently amended): A method of functionalizing an oxygen-containing surface, comprising exposing the surface to precursor molecules, the precursor molecules comprising core atoms from which crosslinking atoms and functional groups extend; the surface being subjected to a pressure of at least 30 psi during the exposing, the precursor molecules interacting with the oxygen of the oxygen-containing surface to form a monolayer across at least a portion of the surface, the monolayer layer comprising the functional groups; and wherein the exposing of the oxygen-containing surface to the precursor molecules occurs in a supercritical fluid.

Claim 31 (canceled).

Claim 32 (original): The method of claim 30 wherein the core atoms are silicon.

Claim 33 (original): The method of claim 32 wherein the precursor molecules are selected from the group consisting of siloxanes, silazanes and chlorosilanes.

Claim 34 (original): The method of claim 30 wherein the pressure is at least 100 psi.

Claim 35 (original): The method of claim 30 wherein the pressure is at least 1000 psi.

Claim 36 (original): The method of claim 30 wherein the pressure is at least 4000 psi.

Claim 37 (original): The method of claim 30 wherein the pressure is at least 8000 psi.

Claim 38 (original): The method of claim 30 wherein the surface is a glass surface.

Claim 39 (currently amended): ~~The method of claim 30 wherein the surface is a surface of a glass fiber; and further comprising,~~ A method of forming a fiberglass matrix, comprising:

providing a glass fiber having an oxygen-containing surface;

providing precursor molecules containing core atoms from which crosslinking atoms and functional groups extend;

exposing the surface to the precursor molecules; the surface being subjected to a pressure of at least 30 psi during the exposing, the precursor molecules interacting with the oxygen of the oxygen-containing surface to form a monolayer across at least a portion of the surface, the monolayer layer comprising the functional groups; and

after forming the monolayer, incorporating the glass fiber into a fiberglass matrix by bonding the monolayer ~~organic group~~ within a polymeric material.

Claim 40 (withdrawn): The method of claim 30 wherein the surface is a surface of aluminum oxide.

Claim 41 (withdrawn): The method of claim 30 wherein the surface is a surface of silicon dioxide.

Claim 42 (withdrawn): The method of claim 30 wherein the surface is a surface of titanium oxide.

Claims 43-56 (canceled).

Claim 57 (new) The method of claim 8 wherein the exposing of the surface to the precursor occurs in a supercritical fluid.

Claim 58 (new) The method of claim 39 wherein the exposing of the surface to the precursor molecules occurs in a supercritical fluid.